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One of the most interesting rocks of the district is the Bassick Mine agglomerate made up of fragments of many different rocks cemented by fine debris of the same character. This is now usually so much decomposed that its original constituents can in many cases no longer be recognized.

In addition to the volcanic rocks mentioned above, a mica-dacite and a limburgite were observed. They are, however, quite rare. All the volcanic rocks have been decomposed by solfataric action, yielding products of various kinds, the two most important of which are a white siliceous clay resulting from the alteration of pitchstone and a quartz alunite rock produced from rhyolite. Analyses of the pitchstone and its alteration product follow:

	SiO_2	Al_2O_3	Fe_2O_3	FeO	MnO	CaO	MgO	K_2O	Na_2O	H_2O	Total
Pitchstone	71.56	13.10	.66	.28	.16	.74	.14	4.06	3.77	5.52	= 99.99
Clay	71.71	12.36	1.10		.17	1.11	1.21	.36	.17	11.97	= 100.16

The andesite is often muscovitized, all of its constituents but augite and orthoclase passing over into aggregates of muscovite apparently with great ease.

The report closes with a discussion of differentiation in which the author does not reach any definite conclusions, except that in the case of the Rosita rocks much of the differentiation which resulted in the different phases of the various types must have taken place either after the lavas had reached their present position, or at any rate at no great depth under the surface.

Notes.—Wolff[1] gives a description and a map of the exposures of eruptive rocks occurring in Sussex Co., N. Y. These exposures include those of the well known eleolite-syenite and associated dyke rocks at Beemerville.

PALÆONTOLOGY.

Schuchert's Synopsis of American Fossil Brachiopoda.[2]—Students of Brachiopoda, as well as Mr. Schuchert, are to be congratulated upon the publication of this important work. Its preparation has extended over a period of eleven years, and entailed references and cross references to upwards of 2,500 species, necessitating about 10,000 citations. All the literature relating to North and South American fossil Brachiopods is recorded in this synopsis, and 2,053 valid species are recognized, of which 1,922 are North American, and 1,859 are restricted to the Paleozoic. It is estimated that 6,000 Paleozoic species have been described for the whole world; therefore about one-third of the number occur in North America.

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[1] Ann. Rep. State Geol. of New Jersey for 1896, p. 91.

[2] A Synopsis of American Fossil Brachiopoda, including Bibliography and Synonymy. By Charles Schuchert, Bulletin U. S. Geol. Survey, No. 87. 8°, 464 pp., Washington, 1897.

In the American Mesozoic, a marked scarcity of Brachiopods exists, since but 49 species have been recorded, and many of these are rare. The Cenozoic representation is even smaller, there being but 14 species. In the North American Cambrian, there are 116 known species, with 319 in the Ordovician, 311 in the Silurian, 662 in the Devonian, while the Carboniferous representation declines to 478. In America, the class practically became extinct with the close of the Paleozoic, for but 11 species are known from the Triassic and 13 from the Jurassic. During the Ordovician, the increase was extremely rapid and all the essential types occur near the base of the system in the Calciferous. The culmination of the class was attained during the Devonian.

Under the geographic distribution of Brachiopods, it is stated that 537 species had great areal or horizontal dispersion, and 121 species are common to North America and other continents. The specific distribution increases with ordinal rank, so that while 25 per cent of the Atremata had dispersion, the Neotremata show 27 per cent; and the higher orders, the Protremata and Telotremata, each show 32 per cent. The order Atremata is best developed in species and genera in the Cambrian and Ordovician systems; the Neotremata in the Ordovician; the Protremata in the Ordovician, Silurian, and Devonian; and the Telotremata in the Devonian. The climax of differentiation is, therefore, chronologically related to phylogenetic or sequential origin. But 8 genera are known to pass from the Paleozoic to the Mesozoic. There are in all 327 Brachiopod genera, 227 of which are Paleozoic.

After the discussion and tables illustrating the geologic development and geographic distribution of the American fossil forms, the author presents a chapter on Brachiopod terminology, in which all the current descriptive terms are defined. The biologic development is then taken up in detail for the separate orders and for special important features, as the protegulum, prodeltidium, cardinal areas, articulation, deltidium, spondylium, etc. The morphology of the brachia is discussed in a separate chapter prepared for this work by C. E. Beecher.

The various schemes of classification applied to the Brachiopods are taken up chronologically, and the strong and weak points of each are critically reviewed. The author then enunciates the principles of a classification based on the history of the class and the ontogeny of the individual. The ordinal grouping proposed by Beecher in 1891 is the only one for the Brachiopods which is founded upon these principles, and is therefore adopted. Schuchert has greatly elaborated and developed the classification along these lines until it is now very complete and satisfactory.

The orders are based mainly upon the nature of the pedicle opening; superfamilies upon the persistent internal characters of the shell; and families within the superfamilies upon a combination of common external and internal generic characters. The generic limitations and the disposal of species are largely in accordance with the work of Hall and Clarke.

The final chapter containing the index and bibliography necessarily constitutes the bulk of the work. The arrangement is alphabetical and will greatly facilitate references to any species or genus. The plan of treatment is as follows: The generic name and author are first given, and also the genotype, or type species of the genus, together with references to all the literature. Then follow the species under the genus, each with its geological distribution, references and synonymy, geographical position, and in many cases, observations on the synonymy, structure, and affinities.—C. E. B.

BOTANY.

Bailey's Principles of Fruit Growing.[1]—This volume of the Rural Science Series, which is issuing under the editorial management of Professor Bailey, contains only eight chapters, but goes into an unusual amount of detail in the discussion of all phases of fruit-growing, from the primary location of the fruit farm to the handling and marketing of its produce. Few problems are as complicated as those underlying the art of horticulture, and the author has done well in analyzing them quite fully, for there is little doubt that intelligent observation in any locality can supply better data for local practice than can be laid down empirically in the best book. Though a rather curiously classified inventory of fruits occupies the early pages, the discussion of practical details is chiefly limited to the varieties growing in the temperate part of the United States.—T.

[1] The principles of fruit-growing. By L. H. Bailey, New York. The Macmillan Company, 1897, pp. xi+508. $1.25.